

CLAIMS

What is claimed is:

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1. A method for enhancing network throughput between an internal network and an external network to which one or more servers are connected, comprising the steps of:
providing a firewall between the internal network and the external network;
opening a plurality of TCP connections between said firewall and one or more of the servers, each said TCP connection having a TCP control block;
creating a common TCP control block for a group of TCP connections through said firewall to the same server; and
placing connection state data shared by each said TCP connection into said common TCP control block, wherein each individual said TCP control block includes a pointer to the CCB for said shared connection state data.
 2. The method of claim 1, further comprising the steps of connecting said firewall to one or more additional firewalls with an internal network, and sharing said common TCP control block with one or more of said additional firewalls connected to said firewall.
 3. The method of claim 2, wherein said sharing step is performed by pushing said common TCP control block from one of said firewalls to one or more of said additional firewalls.
 4. The method of claim 3, wherein said pushing takes place at periodic intervals.
 5. The method of claim 3, wherein one of said firewalls initiates said pushing after opening a new TCP connection.

6. The method of claim 2, wherein said sharing step is performed by pulling said common TCP control block to one firewall from one or more of said other firewalls.
7. The method of claim 6, wherein said pulling takes place at periodic intervals.
8. The method of claim 6, wherein one of said firewalls initiates said pulling before said firewall attempts to open a new TCP connection.
9. The method of claim 2, further comprising the step of storing said one or more common TCP control blocks received from one or more of said other firewalls.
10. The method of claim 2, further comprising the step of adjusting the connection rate and data throughput through one said firewall based on the connection rate and data throughput through said one or more other firewalls, as determined from said one or more common TCP control blocks received from said one or more other firewalls.
11. The method of claim 2, further comprising the step of providing a single physical point of contact between the internal network and the external network.
12. The method of claim 2, further comprising the step of adjusting the connection rate and data throughput of one or more said TCP connection through one said firewall based on the connection rate and data throughput of one or more said other firewalls, as determined from said common TCP control blocks.
13. The method of claim 2, further comprising the step of deleting one of said common TCP control blocks associated with an individual firewall a substantially fixed period of time after said common TCP control block was created.

14. The method of claim 2, further comprising the step of deleting one of said common TCP control blocks associated with an individual firewall a substantially fixed period of time after said common TCP control block was received from another said firewall.
15. The method of claim 1, further comprising the step of deleting one of said common TCP control blocks from one of said firewalls if said common TCP control block has not been used by said one of said firewalls for a substantially fixed period of time.
16. The method of claim 15, wherein said period of time is substantially equivalent to the TCP maximum segment lifetime.
17. The method of claim 1, wherein said firewall is a proxy server.
18. The method of claim 1, further comprising the step of adjusting the connection rate and data throughput of one said TCP connection through said firewall based on the connection rate and data throughput of said other TCP connections, as determined from said common TCP control blocks.
19. The method of claim 1, wherein said common TCP control block created for said firewall is stored in said firewall.
20. A method for enhancing network throughput between an internal network and an external network to which one or more servers are connected, comprising the steps of:
 - connecting two or more firewalls to the internal network, wherein said firewalls are proxy servers;
 - connecting the internal network and the external network through said one or more firewalls;
 - opening a plurality of TCP connections between said firewall and one or more of the

servers, each said TCP connection having a TCP control block;
creating a common TCP control block for a group of TCP connections through said firewall to the same server;
placing connection state data shared by each said TCP connection into said common TCP control block, wherein each individual said TCP control block includes a pointer to the CCB for said shared connection state data;
sharing said common TCP control blocks among said firewalls;
storing said common TCP control blocks received from said one or more other firewalls in said receiving firewall;
adjusting the connection rate and data throughput of each said firewall based on the connection rate and data throughput of said one or more other firewalls, as determined from said one or more common TCP control blocks received from said one or more other firewalls; and
deleting one of said common TCP control blocks from one of said firewalls if said common TCP control block has not been used by said one of said firewalls for a period of time substantially equivalent to the TCP maximum segment lifetime.

21. A method for enhancing network throughput between an internal network and an external network to which a server is connected, comprising the steps of:

connecting two or more firewalls to the internal network;
determining whether a common TCP control block exists for a TCP connection between one of said firewalls and the server, and creating one if one does not exist;
sending a TCP connection request to the server from one of said firewalls; and
updating said common TCP control block based on the response from the server to said TCP connection request.

22. The method of claim 21, further comprising the steps of establishing a connection between said firewall and said server, and updating said common TCP control block with connection state data during said connection.

23. The method of claim 22, further comprising the steps of shutting down said connection, and updating said common TCP control block based on the type of shutdown performed.
24. The method of claim 21, further comprising the step of sharing said common TCP control block with one or more of said other firewalls.
25. A method for enhancing network throughput between an internal network and an external network to which a server is connected, comprising the steps of:
connecting two or more firewalls to the internal network;
receiving a TCP connection request from the server to one of said firewalls;
determining whether a common TCP control block exists for a TCP connection between said receiving firewall and said server, and creating one if one does not exist; and
updating said common TCP control block based on the TCP connection request from the server.
26. The method of claim 25, further comprising the steps of transmitting an acknowledgement and a request for connection to the server, and updating said common TCP control block with the resulting connection state data.
27. The method of claim 26, further comprising the steps of establishing a connection between said firewall and the server and updating said common TCP control block during said connection with connection state data.
28. The method of claim 27, further comprising the steps of shutting down said connection, and updating said common TCP control block based on the type of shutdown performed.
29. The method of claim 25, further comprising the step of sharing said common TCP control

block with one or more of said other firewalls.

30. A system for enhancing throughput between an internal network and an external network to which a server is connected, comprising a firewall between the internal network and the external network, said firewall comprising one or more common TCP control blocks each containing connection state data shared by a plurality of TCP connections between said firewall and the server.

31. The system of claim 30, further comprising one or more additional firewalls connected to the internal network, said firewalls adapted to share common TCP control blocks among one another.

32. The network system of claim 31, wherein said internal network is physically connected to said external network at a single point.

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